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EXAMINER	
WONG, ALLEN C	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	**Application No.** 09/210,775	**Applicant(s)** SHIMADA ET AL.	
	Examiner Allen Wong	**Art Unit** 2621	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *RCE 12/23/08*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-12 and 14* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-12 and 14* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *10 March 2003* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)

2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3) ☒ Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____.

4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ .

5) ☐ Notice of Informal Patent Application

6) ☐ Other: _____.

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

1. A request for continued examination under 37 CFR 1.114 was filed in this application after a decision by the Board of Patent Appeals and Interferences, but before the filing of a Notice of Appeal to the Court of Appeals for the Federal Circuit or the commencement of a civil action. Since this application is eligible for continued examination under 37 CFR 1.114 and the fee set forth in 37 CFR 1.17(e) has been timely paid, the appeal has been withdrawn pursuant to 37 CFR 1.114 and prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on 12/23/08 has been entered.

Response to Arguments

2. Applicant's arguments filed 12/23/08 have been fully read and considered but they are not persuasive.

Regarding lines 11-15 on page 9 of applicant's remarks, applicant asserts that Odaka does not disclose or suggest the specifics of allocating a certain amount of codes to each of the I, B and P pictures in which the amount of codes is larger in the I picture and P picture being second and B picture having the smallest amount of codes, as recited in claim 1. The examiner respectfully disagrees. In column 15, lines 46-51, Odaka discloses that the quantization step sizes for I, P and B pictures are encoded in accordance with quantization step sizes determined by relation I<P<B, in that the I picture uses the smallest quantization step size for increasing the most bits allocated for encoding I picture, the P picture uses the second smallest quantization step size, and

that the P picture uses second most bits for encoding relative to the I picture, and that the B pictures uses the highest quantization step size for allocating the least amount of bits for encoding B pictures. In MPEG coding standard, I pictures are known for being allocated the most amount of bits, P pictures are known for being allocated with the second most bits relative to I pictures, and that B pictures are known for being allocated with the least amount of bits. I pictures need the most amount of bits allocated because the I picture is considered to be the reference picture that are utilized for encoding since P and B pictures are created based on the data obtained from I pictures during the inter-coding process as defined in the MPEG video coding standard. Thus, Odaka discloses that the amount of bits needed to code I pictures is the largest, the amount of bits needed to code the P picture is the second largest and the amount of bits need to code B pictures is the smallest.

Thus, the rejection is maintained.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 1-12 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Odaka (5,317,397) in view of Lee (5,592,226).

Regarding claim 1, Odaka discloses a moving picture encoding system for encoding each picture included in a sequence of moving pictures in units of a unit group

(ie. GOP or Group of Pictures) comprised of a plurality of pictures including said each picture, said system comprising:

encoding control means for, when said unit group includes a plurality of different types of pictures which are to be encoded with different encoding methods (col.15, table 1; note the picture types and the different encoding modes), setting a target quantizer step size used to encode each of the different types of pictures included in said unit group (col.15, ln.46-52; Odaka discloses the quantization step size used to encode the I frame is greater than the quantization step size used to encode the P frame, and similarly, Odaka discloses the quantization step size used to encode the P frame is greater than the quantization step size used to encode the B frame; thus, a target quantizer step size is set to encode the different type of pictures included in said unit group), and for performing a control operation to generate and furnish an updated quantizer step size for each of said I, P and B pictures so that a ratio among the target quantizer step sizes set for the different picture types is a predetermined one (note figure 17, element 717 is a coding controller that generates and furnishes the quantization step size; col.15, ln.46-52 discloses the ratio is predetermined; col.23, ln.34-40 discloses the predetermined ratios of the quantization step sizes);

wherein if the extracted feature of said sequence of moving pictures indicates that the amount of motion between pictures is relatively small, said encoding control means sets the amounts of generated codes assigned to each I-picture, each P-picture, and each B-picture within said unit group so that the amount of generated codes assigned to each 1-picture is the largest, the amount of generated codes assigned to

each P-picture is the second-largest, and the amount of generated codes assigned to each B-picture is the smallest, and, as the amount of motion between pictures represented by the extracted feature increases (col.15, ln.46-51, Odaka discloses that the quantization step sizes for I, P and B pictures are encoded in accordance with quantization step sizes determined by relation I<P<B, in that the I picture uses the smallest quantization step size for increasing the bits allocated for encoding I picture, the P picture uses the second smallest quantization step size, and that the P picture uses second most bits for encoding relative to the I picture, and that the B pictures uses the highest quantization step size for allocating the least amount of bits for encoding B pictures, thus, Odaka discloses that the amount of bits needed to code I pictures is the largest, the amount of bits needed to code the P picture is the second largest and the amount of bits need to code B pictures is the smallest), updates said ratio among the target quantizer step sizes for the different types of pictures so that the differences among the amount of generated codes assigned to each I-picture, each P-picture, and each B-picture are reduced (col. 22, lines 58 to col. 23, ln.5, Odaka discloses that the activity or complexity, ie. spatial and temporal differences, is detected before setting the proper quantization step size for that frame type to encode, in that the complexity obtained from the frame data is extracted and used to help determine the proper quantization step size so that the frames can be properly encoded; col.25, ln.18 to col.26, ln.28, that the ratios among the quantizer step sizes for the different types of pictures are updated; also see col.23, ln.30-45, note the allocation of bits for I, P and B pictures by adjusting the ratios of the quantization step sizes); and

encoding means for encoding said each picture included in said sequence of moving pictures including said each picture using quantizer step size furnished by said encoding control means (note figure 17, element 104, is the quantizer that uses the quantizer step size furnished by the encoding control means 717, then the data is sent to the VLC, Variable Length Coding unit) and using either said each picture or prediction from a past intra-coded image and/or a predictive coded image (note figure 17, element 708 stores the prediction image data from a past intra-coded image and/or a predictive coded image).

Although Odaka does not specifically disclose the limitation "said control operation not being totally dependent on the allocation of quantity of the target amount of codes based on the global complexity measure for each of the picture, but in accordance with features of the sequence of moving pictures which represent a degree of complexity of the sequence of moving pictures to be encoded". However, Lee teaches the use of measurement methods to determine relative distances between frames, where the HOD (Histogram of Difference) method is noted as one of the best because of its sensitivity to local motion, especially when there is no global motion between frames (col.19, lines 48-61 and col.21, line 53+). Lee teaches that the HOD method of determining local motion in between frames can be applied to a group of frames (GOP) so that bit control algorithms can be applied accordingly to adapt to the changing scene complexity between the frames in a GOP (col.20, line 39 to col.21, line 52). Also, Lee teaches that the target bit allocation for each picture type is varied accordingly to adapt to the changing scene complexity found within a sequence of

moving pictures (ie. group of pictures) to be encoded which represent a degree of complexity of the sequence of moving pictures to be encoded (col.35, lines 20-22). In other words, Lee teaches a control scheme that takes the complexity found in the sequence of moving pictures, and adaptively allocates the proper amount of bits for encoding the sequence of moving pictures by changing to the proper quantization step size. Therefore, it would have been obvious to one of ordinary skill in the art to take the teachings of Odaka and Lee as a whole for taking into account of the complexity of the sequence of moving pictures so as to accurately, effectively and efficiently encode the sequence of moving pictures while preserving high image quality and for keeping up with today highly complex encoding standards.

Regarding claim 2, Odaka discloses wherein said encoding control means initially sets the quantizer step size for a macroblock to be encoded first in said each picture currently being encoded to the target quantizer step size set for the picture type of said each picture currently being encoded, and then, each time it encodes each of macroblocks remaining in said each picture currently being encoded, updates the quantizer step size initially set for the first macroblock so that the average of the quantizer step sizes used during the encoding of all macroblocks in said each picture finally approaches the target quantizer step size set for the picture type of said each picture currently being encoded (col. 22, lines 58 to col. 23, ln.5, Odaka discloses that the activity or complexity, ie. spatial and temporal differences, is detected before setting the proper quantization step size for that frame type to encode, in that the complexity obtained from the frame data is extracted and used to help determine the proper

quantization step size so that the frames can be properly encoded; col.25, ln.18 to col.26, ln.28, that the ratios among the quantizer step sizes for the different types of pictures are updated).

Regarding claim 3, Odaka discloses wherein said encoding control means further extracts the feature of said sequence of moving pictures to be encoded which represents a degree of complexity of said sequence of moving pictures to be encoded, and wherein said encoding control means adaptively updates said ratio among the target quantizer step sizes set for the different types of pictures according to said extracted feature of said sequence of moving pictures (col. 22, lines 58 to col. 23, ln.5, Odaka discloses that the activity or complexity, ie. spatial and temporal differences, is detected before setting the proper quantization step size for that frame type to encode, in that the complexity obtained from the frame data is extracted and used to help determine the proper quantization step size so that the frames can be properly encoded; col.25, ln.18 to col.26, ln.28, that the ratios among the quantizer step sizes for the different types of pictures are updated).

Regarding claim 4, Odaka discloses wherein said encoding control means further extracts the feature of said sequence of moving pictures to be encoded which represents a degree of complexity of said sequence of moving pictures to be encoded, and wherein said encoding control means adaptively updates said ratio among the target quantizer step sizes set for the different types of pictures according to said extracted feature of said sequence of moving pictures (col. 22, lines 58 to col. 23, ln.5, Odaka discloses that the activity or complexity, ie. spatial and temporal differences, is

detected before setting the proper quantization step size for that frame type to encode, in that the complexity obtained from the frame data is extracted and used to help determine the proper quantization step size so that the frames can be properly encoded; col.25, ln.18 to col.26, ln.28, that the ratios among the quantizer step sizes for the different types of pictures are updated).

Regarding claim 5, Odaka discloses wherein said encoding control means determines whether an amount of codes to be generated when encoding said each picture in the unit group will deviate by a predetermined range or even more from a target amount of generated codes for said each picture if the encoding is carried out using the target quantizer step sizes set for the plurality of picture types, and wherein, ff said encoding control means determines that such a deviation from the target amount of generated codes will occur, said encoding control means updates the target quantizer step sizes set for the different types of pictures (col. 22, lines 58 to col. 23, ln.5, Odaka discloses that the activity or complexity, ie. spatial and temporal differences, is detected before setting the proper quantization step size for that frame type to encode, in that the complexity obtained from the frame data is extracted and used to help determine the proper quantization step size so that the frames can be properly encoded; col.25, ln.18 to col.26, ln.28, that the ratios among the quantizer step sizes for the different types of pictures are updated).

Regarding claim 6, Odaka discloses wherein said encoding control means determines whether an amount of codes to be generated when encoding said each

picture in the unit group will deviate by a predetermined range or even more from a target amount of generated codes for said each picture if the encoding is carried out using the target quantizer step sizes set for the plurality of picture types, and wherein, ff said encoding control means determines that such a deviation from the target amount of generated codes will occur, said encoding control means updates the target quantizer step sizes set for the different types of pictures (col. 22, lines 58 to col. 23, ln.5, Odaka discloses that the activity or complexity, ie. spatial and temporal differences, is detected before setting the proper quantization step size for that frame type to encode, in that the complexity obtained from the frame data is extracted and used to help determine the proper quantization step size so that the frames can be properly encoded; col.25, ln.18 to col.26, ln.28, that the ratios among the quantizer step sizes for the different types of pictures are updated).

Regarding claim 7, Odaka discloses wherein said encoding control means further extracts the feature of said sequence of moving pictures to be encoded which represents a degree of complexity of said sequence of moving pictures to be encoded, and determines whether a scene change has occurred during the encoding of said each picture included in said unit group, and wherein, if said encoding control means determines that a scene change has occurred during the encoding of said each picture, it updates said ratio among the target quantizer step sizes set for the different types of pictures and their values according to the extracted feature of said sequence of moving pictures (col. 22, lines 58 to col. 23, ln.5, Odaka discloses that the activity or complexity, ie. spatial and temporal differences, is detected before setting the proper quantization

step size for that frame type to encode, in that the complexity obtained from the frame data is extracted and used to help determine the proper quantization step size so that the frames can be properly encoded; col.25, ln.18 to col.26, ln.28, that the ratios among the quantizer step sizes for the different types of pictures are updated).

Regarding claim 8, Odaka discloses wherein said encoding control means further extracts the feature of said sequence of moving pictures to be encoded which represents a degree of complexity of said sequence of moving pictures to be encoded, and determines whether a scene change has occurred during the encoding of said each picture included in said unit group, and wherein, ff said encoding control means determines that a scene change has occurred during the encoding of said each picture, it updates said ratio among the target quantizer step sizes set for the different types of pictures and their values according to the extracted feature of said sequence of moving pictures (col. 22, lines 58 to col. 23, ln.5, Odaka discloses that the activity or complexity, ie. spatial and temporal differences, is detected before setting the proper quantization step size for that frame type to encode, in that the complexity obtained from the frame data is extracted and used to help determine the proper quantization step size so that the frames can be properly encoded; col.25, ln.18 to col.26, ln.28, that the ratios among the quantizer step sizes for the different types of pictures are updated).

Regarding claim 9, Odaka discloses wherein said encoding control means determines whether a scene change has occurred during the encoding of said each picture included in said unit group, and wherein, if said encoding control means

determines that a scene change has occurred during the encoding of said each picture, it adaptively changes the type of the current picture currently being encoded in which the scene change occurs and also updates said ratio among the target quantizer step sizes for the different types of pictures and their values (col. 22, lines 58 to col. 23, ln.5, Odaka discloses that the activity or complexity, ie. spatial and temporal differences, is detected before setting the proper quantization step size for that frame type to encode, in that the complexity obtained from the frame data is extracted and used to help determine the proper quantization step size so that the frames can be properly encoded; col.25, ln.18 to col.26, ln.28, that the ratios among the quantizer step sizes for the different types of pictures are updated).

Regarding claim 10, Odaka discloses wherein said encoding control means determines whether a scene change has occurred during the encoding of said each picture included in said unit group, and wherein, ff said encoding control means determines that a scene change has occurred during the encoding of said each picture, it adaptively changes the type of the current picture currently being encoded in which the scene change occurs and also updates said ratio among the target quantizer step sizes for the different types of pictures and their values (col. 22, lines 58 to col. 23, ln.5, Odaka discloses that the activity or complexity, ie. spatial and temporal differences, is detected before setting the proper quantization step size for that frame type to encode, in that the complexity obtained from the frame data is extracted and used to help determine the proper quantization step size so that the frames can be properly

encoded; col.25, ln.18 to col.26, ln.28, that the ratios among the quantizer step sizes for the different types of pictures are updated).

Regarding claim 11, Odaka discloses wherein said encoding control means only uses an amount of-generated-codes-versus-quantizer-step-size characteristic of pictures of a certain type in order to set the target quantizer step sizes used to encode the different types of pictures which are to be encoded with the different encoding methods (fig.17, Odaka discloses the use of a cyclical encoding process, a loop for recursive encoding processing where the buffer 715 is storing the amount of generated codes outputted from the variable length coding unit 712 and then the buffer 715 has an arrow to go to the coding controller (ie. encoding control means or quantization controller) where the quantization step sizes and the amount of generated codes are evaluated for determining the proper quantization step size so as to encode the different types of pictures the proper corresponding encoding methods).

Regarding claim 12, Odaka discloses wherein said encoding control means only uses an amount-of-generated-codes-versus-quantizer-step-size characteristic of pictures of a certain type in order to set the target quantizer step sizes used to encode the different types of pictures which are to be encoded with the different encoding methods (fig.17, Odaka discloses the use of a cyclical encoding process, a loop for recursive encoding processing where the buffer 715 is storing the amount of generated codes outputted from the variable length coding unit 712 and then the buffer 715 has an arrow to go to the coding controller (ie. encoding control means or quantization controller) where the quantization step sizes and the amount of generated codes are

evaluated for determining the proper quantization step size so as to encode the different types of pictures the proper corresponding encoding methods).

Regarding claim 14, Odaka discloses wherein when said unit group includes a picture to be intra-coded or an I-picture, a picture to be predictive-coded or a P-picture, and a picture to be bidirectionally- predictive-coded or a B-picture (col.15, ln.1-34, Odaka discloses the sequence of moving pictures that includes the encoding control means for coding the I, P and B pictures), said encoding control means extracts the feature of said sequence of moving pictures which represents a degree of complexity of said sequence of moving pictures to be encoded, and wherein ff the extracted feature of said sequence of moving pictures indicates that the amount of motion between pictures is relatively small, said encoding control means sets target amounts of generated codes allocated to each I-picture, each P-picture, and each B-picture in said unit group so that the target amount of generated codes allocated to each I-picture, is the largest, the target amount of generated codes allocated to each P-picture is the second-largest, and the target amount of generated codes allocated to each B-picture is the smallest, and, as the mount of motion between pictures represented by the extracted feature increases, updates said ratio among the target quantizer step sizes for the different types of pictures so that the differences among the target amounts of generated codes allocated to each I- picture, each P-picture, and each B-picture are reduced (col. 22, lines 58 to col. 23, ln.5, Odaka discloses that the activity or complexity, ie. spatial and temporal differences, is detected before setting the proper quantization step size for that frame type to encode, in that the complexity obtained from the frame data is extracted

and used to help determine the proper quantization step size so that the frames can be properly encoded; col.25, ln.18 to col.26, ln.28, that the ratios among the quantizer step sizes for the different types of pictures are updated; also, col.15, ln.46-51, Odaka discloses that the quantization step sizes for I, P and B pictures are encoded in accordance with quantization step sizes determined by relation I<P<B, in that the I picture uses the smallest quantization step size for increasing the bits allocated for encoding I picture, the P picture uses the second smallest quantization step size, and that the P picture uses second most bits for encoding relative to the I picture, and that the B pictures uses the highest quantization step size for allocating the least amount of bits for encoding B pictures, thus, Odaka discloses that the amount of bits needed to code I pictures is the largest, the amount of bits needed to code the P picture is the second largest and the amount of bits need to code B pictures is the smallest).

Contact Information

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allen Wong whose telephone number is (571) 272-7341. The examiner can normally be reached on Mondays to Thursdays from 8am-6pm Flextime.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mehrdad Dastouri can be reached on (571) 272-7418. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Primary Examiner
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1/23/09